

REMARKS

The amendments set out above and the following remarks are believed responsive to the points raised by the Office Action dated March 18, 2004. In view of the amendments set out above and following remarks, reconsideration is respectfully requested.

Claims 1 and 5 were rejected under 35 U.S.C. § 102 as anticipated by U.S. Patent No. 4,519,959 to Takeuchi et al. (hereinafter referred to as "Takeuchi"). This rejection is respectfully traversed.

The present invention is directed to a liquid phase oxidation reactor having a structure reducing oxidation of a reaction solvent by adjusting the effective contact time during which an oxygen-containing gas is in contact with a reactant. The liquid phase oxidation reactor comprises a substantially cylindrical reaction vessel having an interior space, a lid combined with and closing the reaction vessel, at least one stirring blade disposed within the reaction vessel and rotated by a driving source outside the reaction vessel, a liquid phase supplying line penetrating a sidewall of the reaction vessel for supplying a liquid phase reactant to the reaction vessel, a liquid phase discharging line penetrating the sidewall of the reaction vessel for draining from the reaction vessel a product produced by a chemical reaction in the reaction vessel, and a gas feed nozzle penetrating the sidewall of the reaction vessel and including a bend within the reaction vessel for supplying an oxygen-containing gas to the reaction vessel. The reactor of claim 1 further includes an angle adjusting means supporting the gas feed nozzle for turning the gas feed nozzle so that an outlet of the gas feed nozzle may be selectively directed toward the stirring blade or the sidewall of the reaction vessel. Independent claim 5 defines the gas feed nozzle as being fixedly mounted in the sidewall so that an outlet of the gas feed nozzle faces the sidewall of the reaction vessel.

A reference anticipates a claimed invention only if it discloses each and every element of the claimed invention. Takeuchi fails to disclose each and every element of independent claims 1 and 5 and therefore fails to anticipate those claims. For example, Takeuchi does not disclose an angle adjusting means supporting the gas feed nozzle for turning the gas feed nozzle so that the outlet of the nozzle may be selectively directed toward the stirring blade or the sidewall of the reaction vessel, as defined in claim 1. Takeuchi also fails to disclose a gas feed nozzle fixedly mounted in the sidewall of the reaction vessel so that an outlet of the gas feed nozzle faces the sidewall of the reaction vessel.

The Office Action refers to "Figure 9, item 33 base" of Takeuchi as disclosing an angle adjusting means for supporting and turning the gas feed nozzle so that the gas feed nozzle outlet may face the stirring blade or the sidewall of the reaction vessel. However, Figure 9 of Takeuchi merely shows gas distributor 33, as a pipe "having one end communicated with the gas source 50" (col. 9, lines 14-17). There is no "base" that comprises "angle adjusting means" as in the presently claimed invention. Indeed, nothing in Takeuchi suggests adjusting the angle of the gas distributor pipe 33. Furthermore, as clearly seen in Figure 9, the outlet of gas distributor pipe 33 does not face an interior sidewall of the reaction vessel but is facing upwardly towards the underside of the rotary disintegrator 34. Indeed, the specification of Takeuchi explicitly states, "This pipe 33 having one end communicated with the gas source 50 . . . with the other open end terminating immediately below the central region of the rotary disintegrator 34" (col. 9, lines 16-20).

Takeuchi fails to disclose angle adjusting means for turning a gas feed nozzle so that an outlet of the gas feed nozzle may be selectively directed toward the stirring blade or toward a sidewall of the reaction vessel (claim 1) or a gas feed nozzle fixedly mounted so that an outlet faces an interior sidewall of the reaction vessel (claim 5). Thus, Takeuchi fails to anticipate claims 1 and 5.

Claims 1-5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takeuchi in view of JP 61-222526 to Fukutome et al. (hereinafter referred to as "Fukutome"). This rejection is respectfully traversed.

According to the Office Action, "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Takeuchi et al. to utilize the rotatable nozzle of Fukutome et al. in order to enhance the stirring and mixing of the entire container". However, even assuming *arguendo* that one of skill in the art was led from the teaching of Takeuchi to the teaching of Fukutome, one would not obtain the present invention from any modification of Takeuchi by Fukutome. For example, nothing in Takeuchi or Fukutome teaches or suggests fixedly mounting a nozzle so that an outlet faces the sidewall of a reaction vessel or angle adjusting means for turning a gas feed nozzle so that an outlet may be selectively directed toward the stirring blade or toward the sidewall of the reaction vessel. Accordingly, *prima facie* obviousness of claims 1 and 5 has not been established.

First, with respect to claim 5, the presently claimed invention includes, *inter alia*, a gas feed nozzle *fixedly mounted so that an outlet of the gas feed nozzle faces the sidewall of the reaction vessel*. Modifying the apparatus of Takeuchi to include the rotatable nozzle of Fukutome would not lead to a gas feed nozzle *fixedly mounted* in any position. Rather, the

combination of Takeuchi and Fukutome would lead to a rotatable nozzle, as the Office Action asserts. Moreover, even if Fukutome's rotating nozzle were stationary, its outlet would not face a sidewall of the reactor. The outlet of the Fukutome nozzle, like the outlet of the Takeuchi nozzles, is parallel to the sidewall of the reactor and cannot face the sidewall. For these reasons the rejection of claim 5 as obvious is improper and should be withdrawn.

In addition, Takeuchi emphasizes that the supply of gaseous medium into the vessel be centered immediately below a central region of the rotary disintegrator. For example, Takeuchi discloses that, "the perforated piping may be in the form of . . . any other suitable shape provided that the supply of gaseous medium into the vessel can be centered immediately below a central region of the rotary disintegrator" (col. 3, lines 15-20). Thus, one of skill in the art reading Takeuchi would never be led to modify Takeuchi to position the open end of the gas distributor to face somewhere other than below the central region of the rotary disintegrator, e.g., to face the sidewall of the reaction vessel. Accordingly, the rejection of claim 5 is improper and should be withdrawn.

With respect to claim 1, the presently claimed invention includes, *inter alia*, angle adjusting means so that an outlet of the gas feed nozzle may be selectively directed toward the stirring blade or toward the sidewall of the reaction vessel. As explained above, one of skill in the art would never be led to modify Takeuchi to include a nozzle that faces a sidewall of the reaction vessel, and thus one would not modify the gas distributor of Takeuchi to rotate so that the nozzle can be selectively directed toward the sidewall of the reaction vessel. Based on the importance Takeuchi places on positioning the gas outlet immediately below the central region of the rotary disintegrator, if one of skill in the art were to modify the apparatus of Takeuchi to include the rotatable nozzle of Fukutome, one would position the nozzle to rotate so that the outlet was still positioned immediately below the central region of the rotary disintegrator. For example, with regard to Figure 9 of Takeuchi, to which the Examiner directed attention, the modification by Fukutome would result in rotation of pipes 31 or 33 about a vertical axis. As in Fukutome itself, the outlet of the nozzle would never face the sidewall of the reactor. Thus, one of skill in the art simply would not be led by Takeuchi and Fukutome to position the nozzle to be selectively directed toward the sidewall of the reaction vessel. Accordingly, the rejection of claims 1-4 as obvious is improper and should be withdrawn.

In view of the amendments and remarks recited herein, the application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue.

In re Appln. of Jae-Sung LEE
Application No. 09/893,694

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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